REMARKS

The Examiner's recognition of Applicants' invention by the indication of allowable subject matter for claims 4-12, 15-21, and 24-30 is gratefully acknowledged.

Claims 1 and 22 have been amended to more particularly point out htat the present invention includes varying the frequency of the microwave signal applied to the transmission line, as described, for example, in paragraph 0025. Claim 27 is amended to be dependent upon claim 23, as discussed below.

Claim Rejection under 35 USC § 112

Claims 27-30 were rejected under35 USC § 112 as indefinite, in that the claims lack a proper antecedent for the variable frequency oscillator recited therein. Following the amendment, claim 27 is made dependent upon claim 23, which calls out a variable frequency oscillator. No independent grounds were presented for the rejection of claims 28-30; and it is believed that they were included in the rejection because they are dependent upon claim 27. Therefore, in view of the amendment to claim 27, it is requested that the rejection of the claims be withdrawn.

Claims Rejection under 35 USC § 102(b)

Claims 1-3, 13-14, 22-23, and 31 were rejected under 35 U.S.C. § 102(b) as anticipated by United States Patent No. 4,345,202, issued to Nagy et al. in 1982.

Nagy et al. is discussed in the Background of the present application at paragraphs 0003 and 0004. The technique in Nagy et al. requires multiple microwave detectors 38, 40, and 42 in Fig. 4 spaced at predetermined distances from a mesh screen 36. During operation, the reflection off the mesh screen produces a standing microwave characterized by a null position that is detected by the detectors, col. 3, line 58, to col. 4, line 15. The position of the null is a function of the soot content. Thus, Nagy et al. detects the distance of the null from the reflector screen in order to determine soot content, col. 4, lines 11-21. In contrast, Applicants' method varies the frequency of the microwave signal, determines the probe frequency needed to achieve a null voltage for a standing wave at a stationary detection point, and compares the frequency to a reference frequency to determine the soot concentration. Nagy et al. utilizes a pre-selected, non-varying frequency, and does not contemplate obtaining a reference frequency or comparing the null-producing frequency to the reference frequency. Thus, Nagy et al. does not teach or suggest the present invention.

Claim 1 is directed to Applicants' method that includes detecting the probe voltage at a stationary detection point, wherein the several steps of the method relate to that voltage at that point. Nagy et al. provides detectors at stationary points, but requires multiple detectors to achieve soot determination. As a result, there are substantial differences between the methods. Nagy et al. uses a constant frequency, whereas the claimed method calls for varying the frequency. Applicants' method determines the probe frequency when the probe voltage is a null voltage of a standing wave, whereas

Nagy et al. determines the length whereat the null voltage is found. Nothing in Nagy et al. would suggest varying the frequency, and indeed, the measurements in Nagy et al. are made without determining the frequency, provided that it is constant. Claim 1 further calls for comparing the probe frequency to a probe reference frequency. Nagy et al. does not obtain a probe reference frequency and so cannot point to the comparison as the basis for calculation of the concentration of the soot particles, as called for in the claim. Thus, Nagy et al. does not anticipate, or even suggest, Applicants' method as set forth in claim 1.

Claims 2-3 and 13-14 are dependent upon claim 1, and not taught or suggested by Nagy et al. for the reasons set forth with regard to that claim, but recite features preferred in the practice of Applicants' invention.

Claim 22 is directed to Applicants' apparatus for detecting a concentration of soot particles in engine oil that includes means for varying the frequency of the microwave signal applied to the probe tip, means for detecting a probe voltage at a stationary detection point, means for determining a probe frequency when the probe voltage is equal to a null voltage of a standing wave, and means for comparing the probe frequency to a probe reference frequency. For the reasons set forth with regard to the rejection of claim 1, Nagy et al. does not teach or suggest varying or determining the probe frequency, providing a reference frequency, or comparing the probe frequency corresponding to a null voltage and the reference frequency in calculating the soot concentration. Thus, Nagy et al. does not teach or suggest Applicants' apparatus in claim 22, or in claims 23

and 31 dependent thereon.

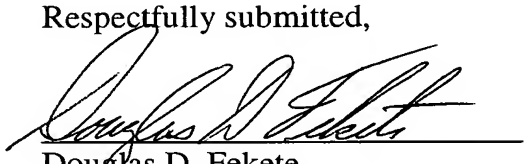
Accordingly, it is respectfully requested that the rejection of the claims 1-3, 13-14, 22-23, and 31 based upon Nagy et al. be reconsidered and withdrawn, and that the claims be allowed.

Conclusion

Claims 4-12, 15-21, 24-30 were indicated as allowable, but objected to as depending upon a rejected base claim. For the reasons herein, it is believed that the grounds for rejection of the base claims have been addressed and overcome, and, accordingly, that all claims are in condition for allowance. If it would further prosecution of the application, the Examiner is urged to contact the undersigned at the phone number provided.

The Commissioner is hereby authorized to charge any fees associated with this communication to Deposit Account No. 50-0831.

Respectfully submitted,



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